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DRAWINGS SHOWING
INSECT CONTROL METHODS
USED AGAINST BARK BEETLES
IN THE
WESTERN NATIONAL PARKS AND FORESTS

Prepared by the Branch of Forestry,
National Park Service, in Cooperation with
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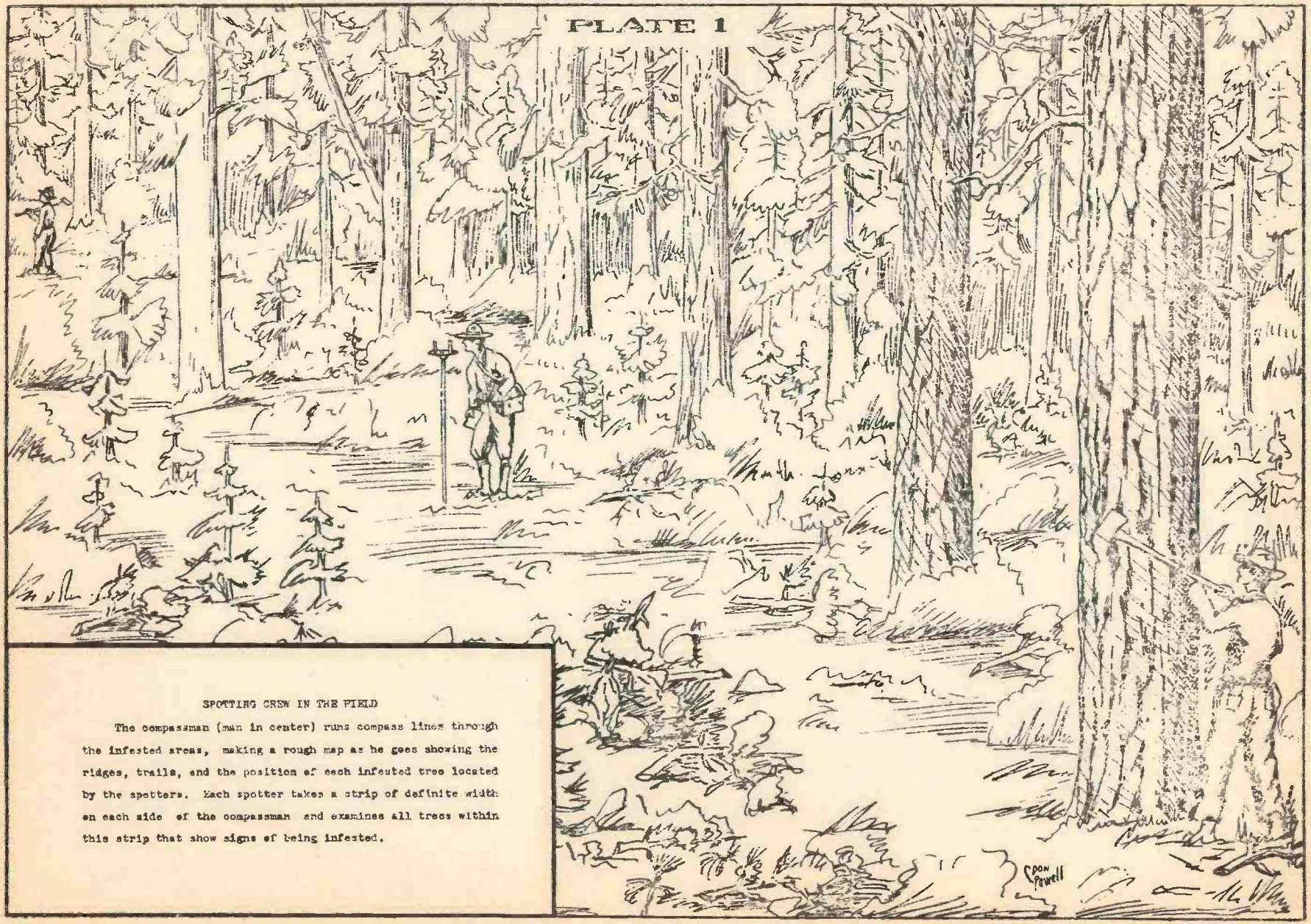
Berkeley, California
April 1, 1935

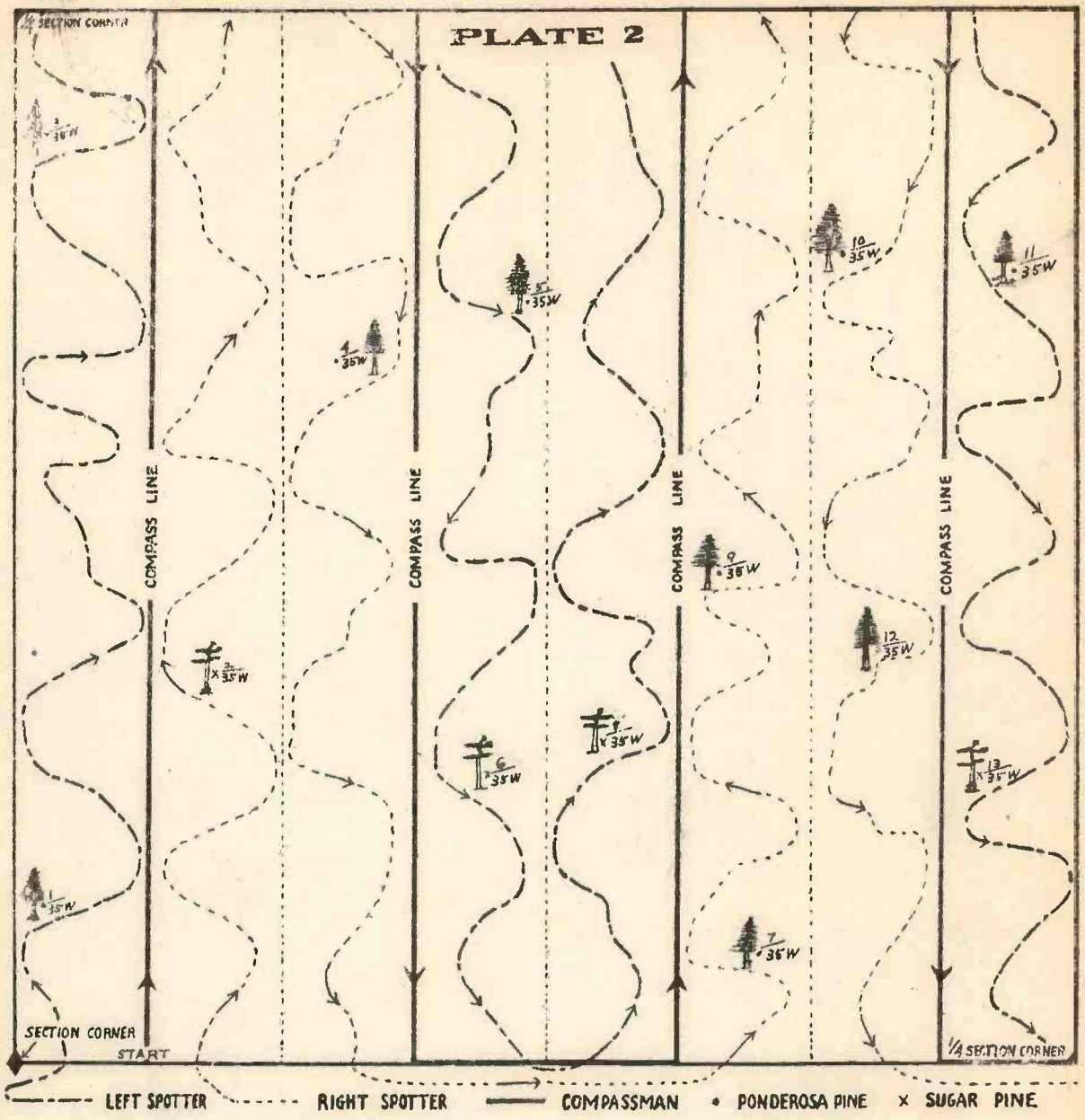
PLATE 1



SPOTTING CREW IN THE FIELD

The compassman (man in center) runs compass lines through the infested areas, making a rough map as he goes showing the ridges, trails, and the position of each infested tree located by the spotters. Each spotter takes a strip of definite width on each side of the compassman and examines all trees within this strip that show signs of being infested.

PLATE 2



Diagrammatic view showing the method of gridironing a section (only ¼ section is shown) to locate the infested trees. The compassman starts 5 chains from the section corner and runs a compass line due north. The spotters on each side of the compassman move along even with him and each covers a strip 5 chains wide examining all trees that look as though they were infested. On reaching the end of the section the compassman turns off a right angle, goes ten chains east along the section line, then turns off another right angle, and returns, running his compass line due south until he reaches the section line from which he started. The spotters keep the same position on each side of the compassman as shown in the diagram, and in this way the entire section is covered. With average going, a spotting crew can cover about half a section a day. The compassman keeps record of the distance covered by pacing.

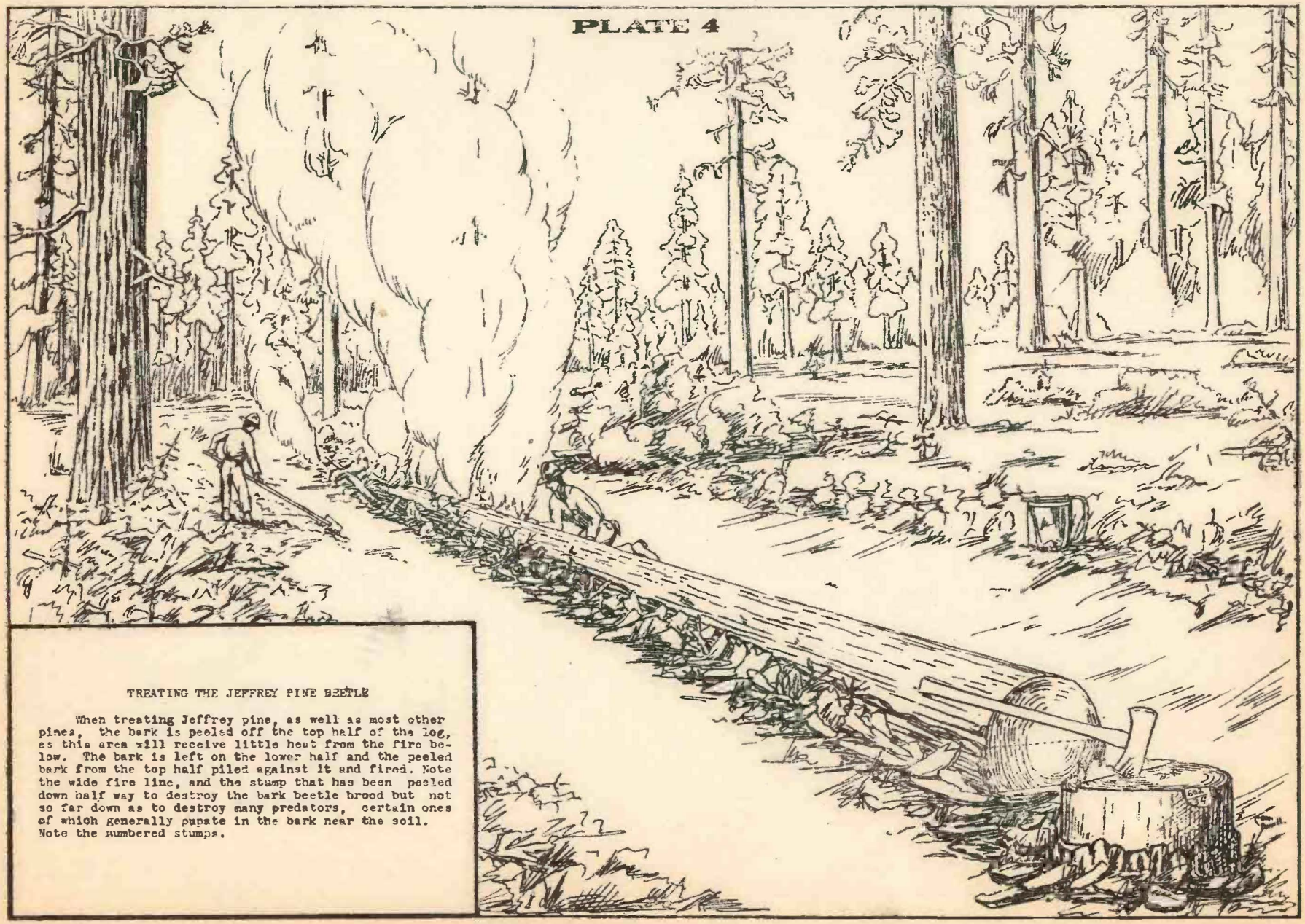
MARKING AN INFESTED TREE

When an infested tree is located by one of the spotters, he calls out to the compassman for the number to be put on the tree. The spotter then blazes the tree above his head on three or four sides so that the blazes will not be hidden by underbush, and that at least one of the blazes will be seen from which ever side the treating foreman approaches.

The tree number is marked in, on one of the blazes, in the form of a fraction; the number above the line being the tree number; the number below, the year of attack (1934 in this case). The "S" following the "34" stands for "summer" and shows that the beetles attacked the tree during spring or early summer and will emerge before fall. If spotting were being done during the late fall or early spring the letter "W" (winter) would have been used as it means that the beetles will pass or have already passed the winter in the tree. This information is necessary as it helps to show the trend of the infestation and also serves as a check on the spotters understanding of the job.

The spotter also fills out a tree tag on which he gives the full tree number, date of spotting, kind of insects in tree, tree species, and other necessary information. The tag is then folded and placed tightly in a slit made in the bark. When the treating foreman comes to cut the tree, he takes the tag, marks in the date of treating and infested length, and each evening turns in the tags from all the trees he has treated that day to the camp foreman who checks the tags off against the compassman's spotting record, thus showing what trees have been treated.

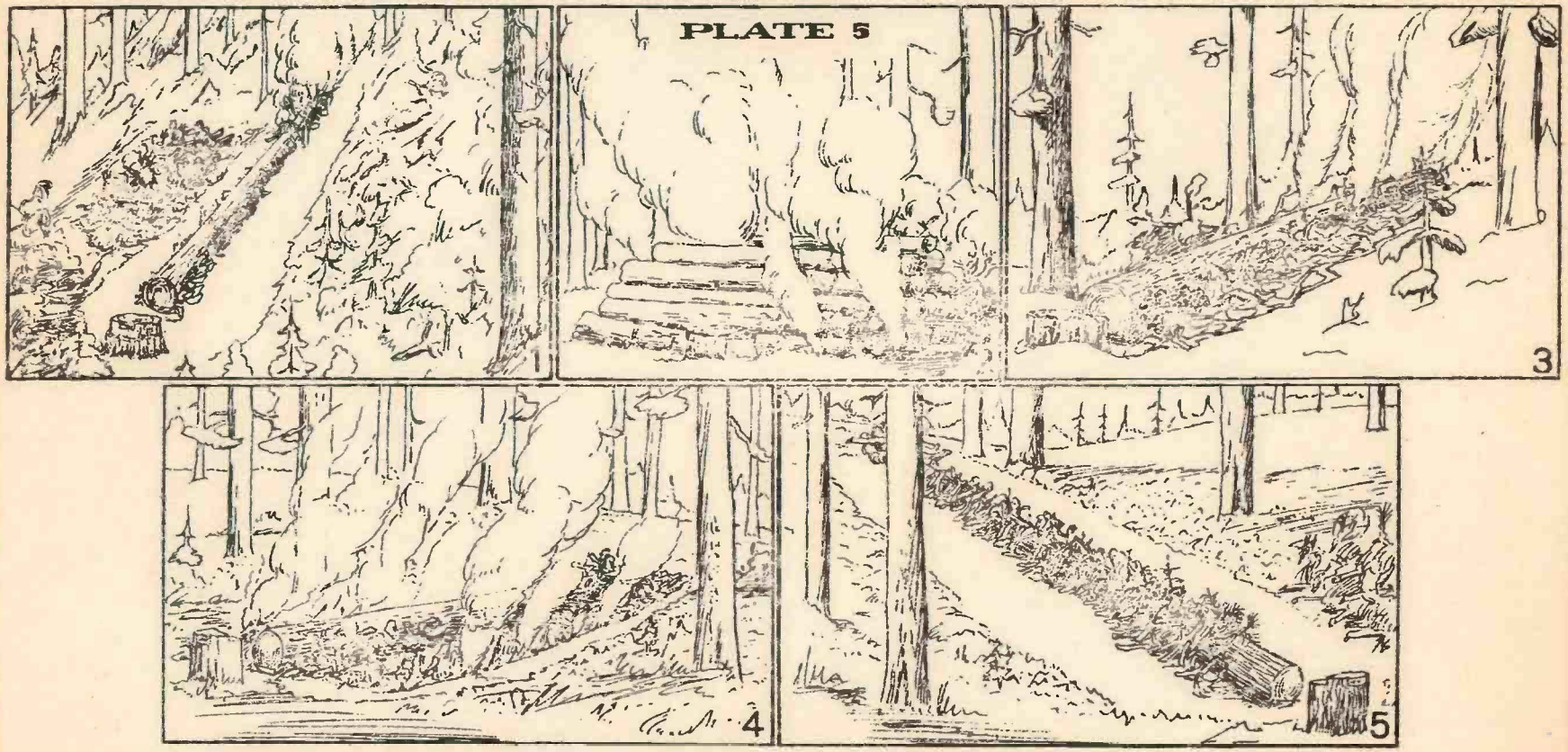
PLATE 4



TREATING THE JEFFREY PINE BEETLE

When treating Jeffrey pine, as well as most other pines, the bark is peeled off the top half of the log, as this area will receive little heat from the fire below. The bark is left on the lower half and the peeled bark from the top half piled against it and fired. Note the wide fire line, and the stump that has been peeled down half way to destroy the bark beetle brood but not so far down as to destroy many predators, certain ones of which generally pupate in the bark near the soil. Note the numbered stumps.

PLATE 5



HINTS FOR BETTER BURNING

Figure 1. When treating on a slope, always drop the tree up hill. After the bark has been peeled off the upper portion, it is piled close along the sides with a few limbs, and the fire started at the upper end of the log. As fire burns more slowly down than up, there is less chance of it escaping, or scorching nearby trees. The top of the tree usually breaks and can be thrown back alongside the trunk thus shortening the fire line.

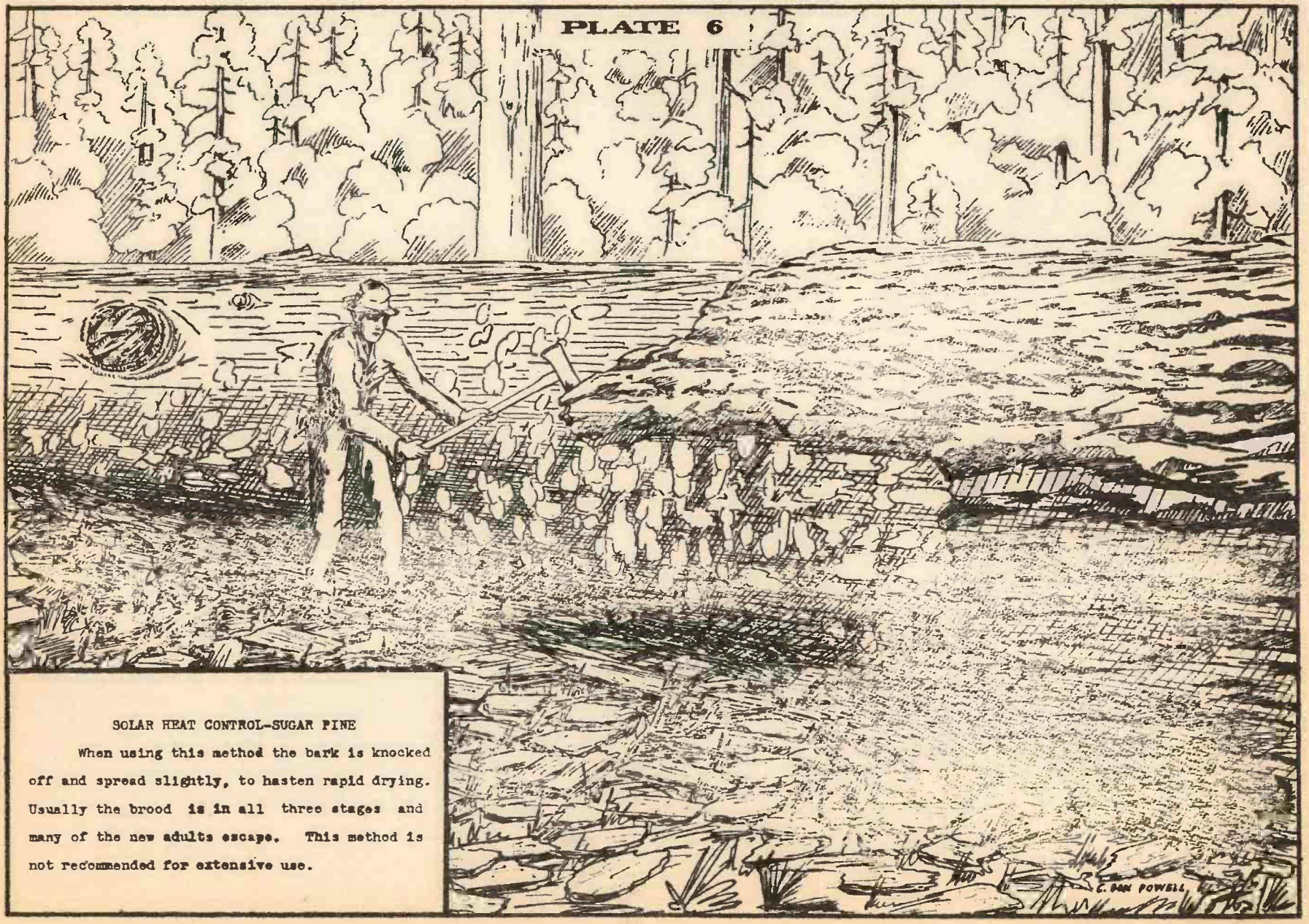
Figure 2. When treating smaller trees they can often be cut into 16 foot logs, decked, and fired. This saves considerable time as only a single fire line is required. An open spot should be found where the large fire will scorch no trees.

Figure 3. During winter treatment, the fire lines can be built much closer to the tree trunk, and less precautions are necessary as very little scorching occurs during the winter burning.

Figure 4. Towards the end of spring control jobs, conditions are often so dry that a fire is hazardous. When there are a few trees left to burn, this method is used. The fire line is placed around the tree some distance from it and a back fire started, which when it burns up to the prepared tree, has made a good wide safety zone.

Figure 5. In some cases it is often practicable to place limbs over the log in order to draw the fire around the bole and scorch the upper surface. This method is used chiefly where the bark is very tight, there is little fire hazard, and most important, where the trees are not very large.

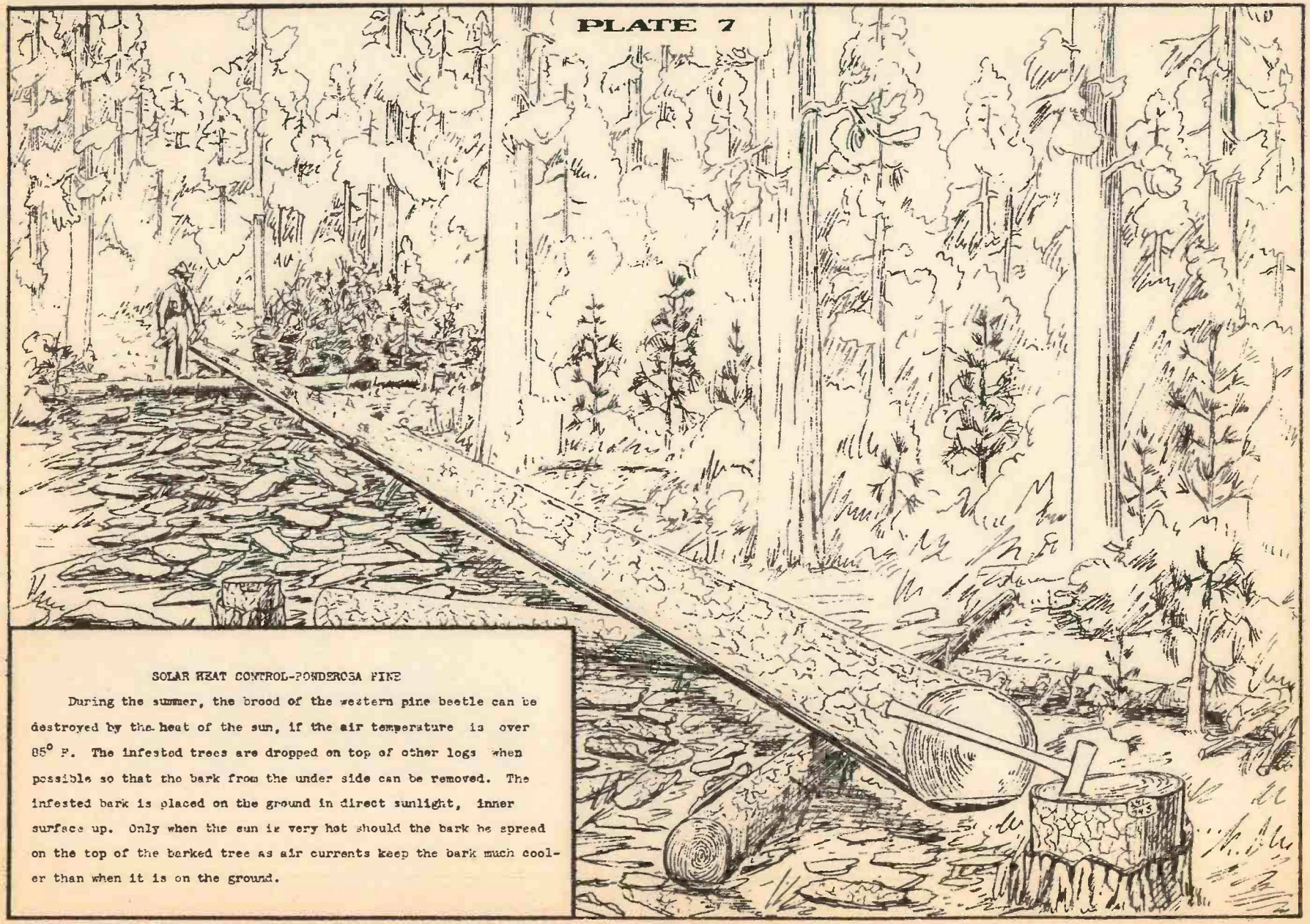
PLATE 6



SOLAR HEAT CONTROL-SUGAR PINE

When using this method the bark is knocked off and spread slightly, to hasten rapid drying. Usually the brood is in all three stages and many of the new adults escape. This method is not recommended for extensive use.

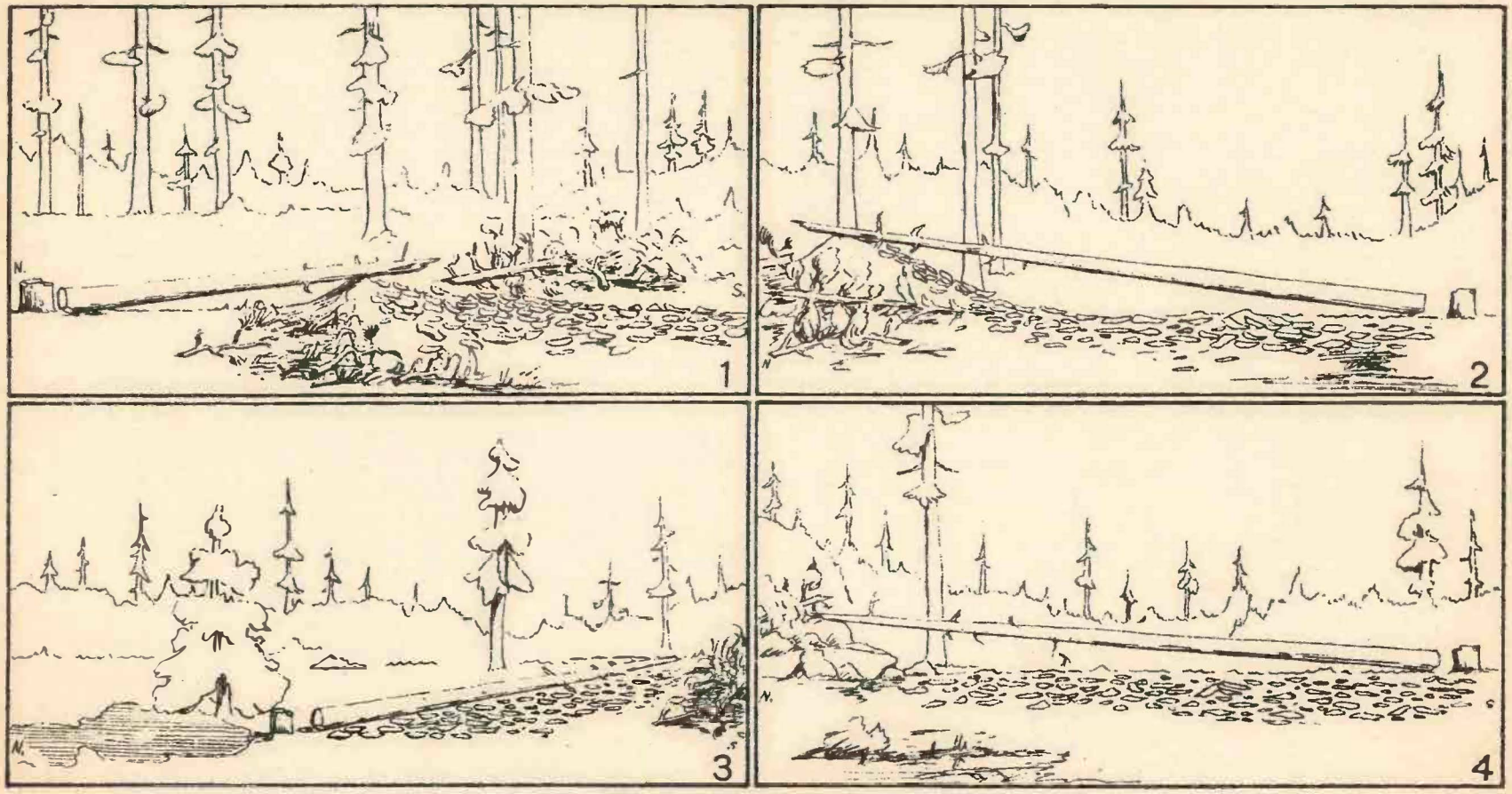
PLATE 7



SOLAR HEAT CONTROL-PONDEROSA PINE

During the summer, the brood of the western pine beetle can be destroyed by the heat of the sun, if the air temperature is over 85° F. The infested trees are dropped on top of other logs when possible so that the bark from the under side can be removed. The infested bark is placed on the ground in direct sunlight, inner surface up. Only when the sun is very hot should the bark be spread on the top of the barked tree as air currents keep the bark much cooler than when it is on the ground.

PLATE 8



HINTS FOR BETTER SOLAR HEAT CONTROL-PONDEROSA PINE

Figure 1. A tree dropped over a small knoll so that the bark from the underside can be removed. The tree has been dropped north and south, and in order to get the quickest kill the bark has been spread out on the south side of the knoll where it is exposed to the most direct rays of the sun.

Figure 2. A tree dropped across a hollow, which also serves to keep it off the ground. The bark is again spread on the south exposure of the slope.

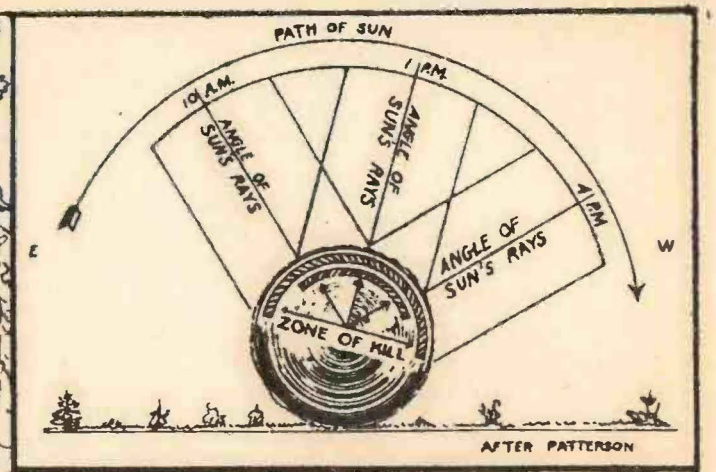
Figure 3. A tree lying flat on the ground. This is poor falling and should not be done if it can be avoided. The bark, as shown, should be placed so as not to be shaded by any nearby trees.

Figure 4. A tree dropped across a pile of rocks to keep the trunk off the ground. By careful planning such as shown or by placing larger limbs where a tree is to be fallen, one can usually drop the tree so that all or most of the bark on the underside can be removed without difficulty.

PLATE 9

SOLAR HEAT CONTROL-MOUNTAIN PINE BEETLE IN LODGEPOLE PINE

When employing this method one should try to drop the full length of the log flat on the ground, in a north and south direction. The bark is left on as it is so thin that it gives but little protection to the brood from the heat of the sun. The upper side of the tree is left exposed to the sun for two days when it is rolled one-half over. When turned, a chip is taken out of the butt end, as shown, which indicates that the log has been turned. Note that the top is cut off at the end of infestation to facilitate rolling the log.



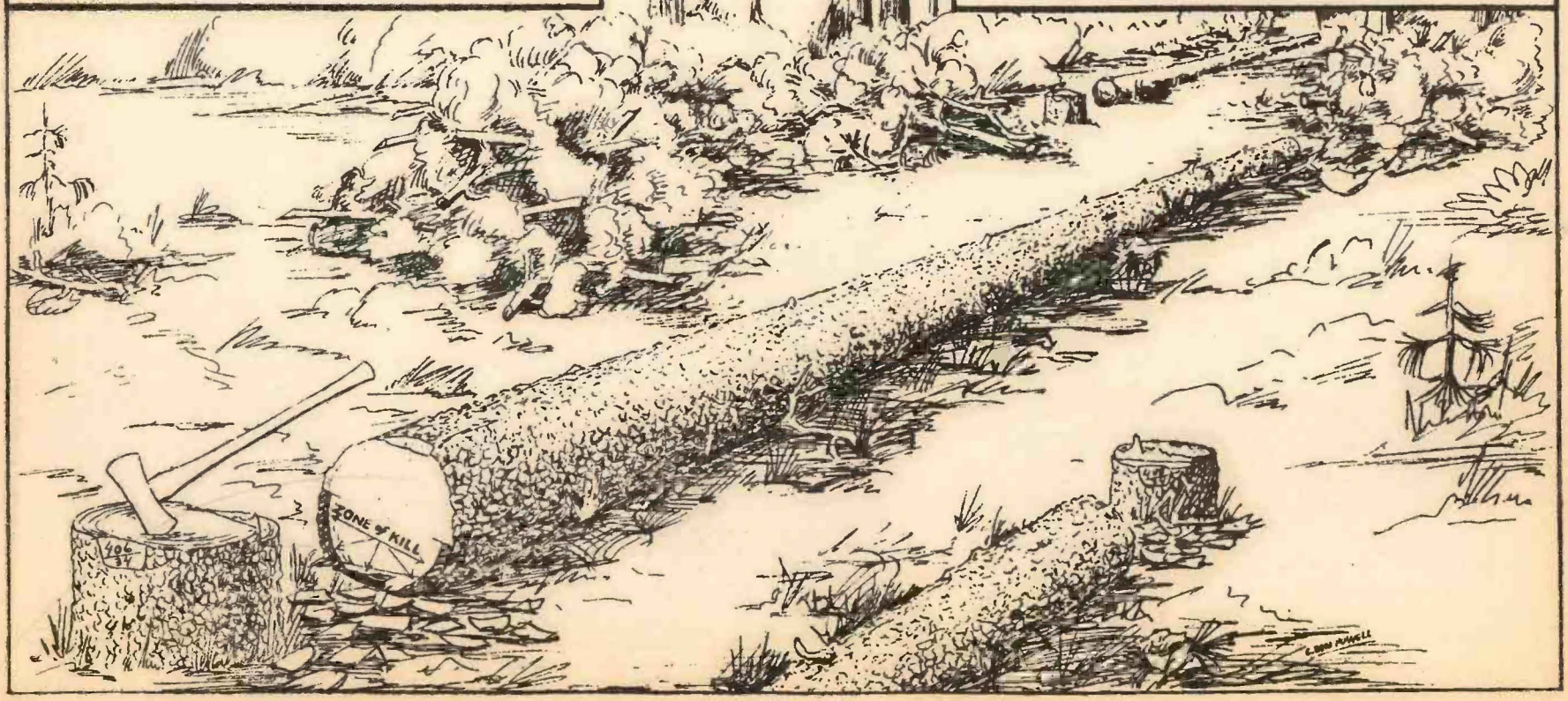
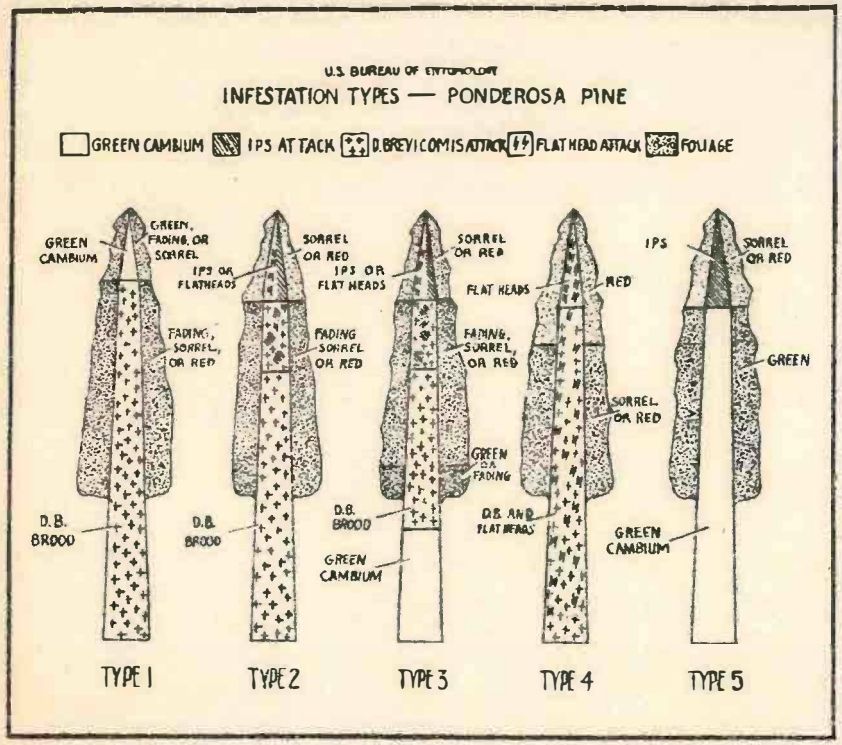
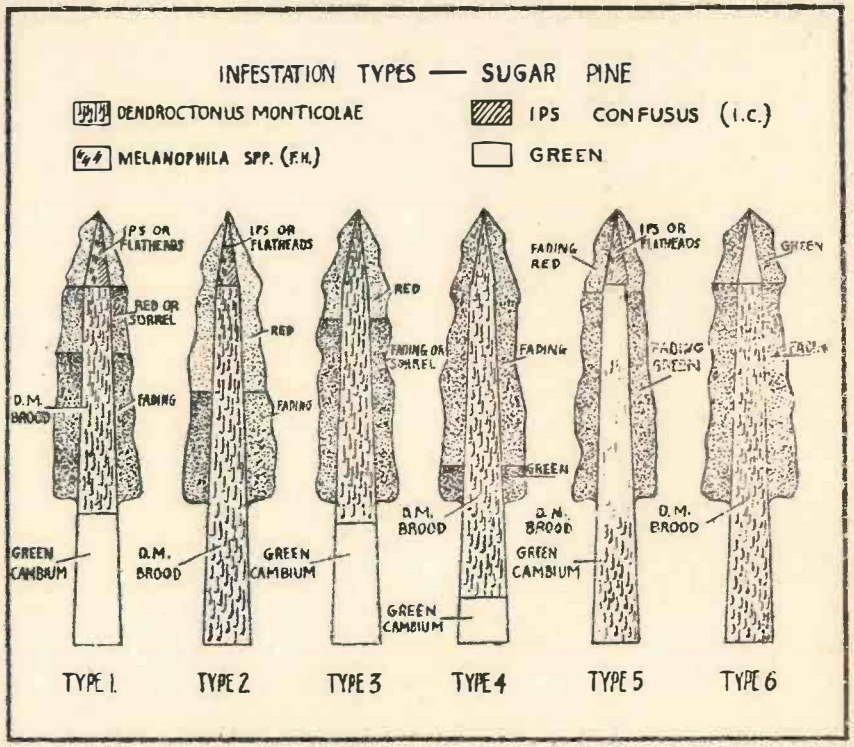


PLATE 10





The above diagrams show the variation of infestation in trees attacked by the beetles. It is these variations that frequently make spotting so difficult as the base may be green when there is brood in the trunk above, or there may be brood in the base but none or only a few beetles higher up. It often requires considerable experience to determine when a tree should be marked for treating and when it should be left unmarked. In both the ponderosa pine and sugar pine stands, Types 1 and 2 are the most common.